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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/383,340	08/25/1999	STEVEN KLEIMAN	NAP-010	6451

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EXAMINER

KUPSTAS, TOD A

ART UNIT	PAPER NUMBER
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2153

DATE MAILED: 03/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/383,340

Applicant(s)

KLEIMAN, STEVEN

Examiner

Tod Kupstas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-7, 9, 10 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6, 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Hemphill et al. (US 5,781,716).

As set forth in claim 1, Hemphill discloses a file server system including a plurality of file server nodes (elements 100 and 200, figure 1); at least one inter-node connectivity element (element 150) coupled to said plurality of nodes; at least one switch (switch 3), coupled to said plurality of nodes and disposed for coupling file server commands to one thereof; said nodes including a set of pairs (the servers 100 and 200), each said pair being coupled to a set of storage elements and being disposed to control said storage elements in response to said file server commands (the disk subsystems 102, and 202); also see col. 2, lines 20-54.

As set forth in claim 2, Hemphill discloses a system wherein at least some of said pairs are disposed for failover from a first node to a second node; see col. 2, lines 20-54.

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As set forth in claim 3, Hemphill discloses a system wherein each said node includes a processor and a memory (having a server contain a processor and memory is inherent to what a server is, furthermore it can inferred from the disclosure that the server possesses such elements by being capable to run applications).

As set forth in claim 4, Hemphill discloses a system wherein each said storage element corresponds to one said pair (storage elements 102 and 202 both correspond to one pair (100, 200); each said storage element is coupled to both nodes in said corresponding pair (the switch provides for the coupling to both servers); whereby both nodes in said corresponding pair are equally capable of controlling said storage element (the purpose of the switch in Hemphill is to permit both controllers, 216, and 212 or 112 and 116, to control the storage elements).

As set forth in claim 6, Hemphill discloses a system wherein said file server system is scalable by addition of a set of pairs of said node; see col. 11, line 17-col. 12, line 7.

As set forth in claim 13, Hemphill discloses a method of operating a file server system, said method including steps for operating a plurality of file server nodes in a set of pairs (100, 200), each said pair being responsive to a set of file server commands (more than the pair disclosed can be utilized); coupling said file server commands to said pairs; coupling a set of messages between one of said nodes in a first said pair and ones of said nodes in a second of said pair (through element 150); see col. 2, lines 20-54.

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As set forth in claim 14, Hemphill discloses a method including steps for failover from a first node to a second node, and from said second node to said first node in each said pair (both servers can back each other up); see col. 2, lines 20-54.

As set forth in claim 15, Hemphill discloses a method including steps for scaling said file server by addition of a set of pairs of said nodes; see col. 11, line 17-col. 12, line 7.

As set forth in claim 16, Hemphill discloses a method including steps for controlling a set of storage elements corresponding to one said pair from either node in said pair (each server has two controllers 112, 116, and 212, and 216 for controlling the storage elements).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5, 7, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemphill et al. (US 5,781,716).

As set forth in claim 5, Hemphill does not disclose having a NUMA network. A NUMA network is the state wherein a system has both DMA and remote memory access. Although not explicitly stated it would appear that Hemphill actually already maintains the two memory access

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states through the servers. Official notice is taken to having a NUMA network. It would have been obvious to a person of ordinary skill in the art at the time this invention was made to have provided the system of Hemphill, with the NUMA system. The rationale is as follows: It would have been desirable to have permitted memory access to clients in a variety of ways. As having both direct and remote memory access is a standard way of achieving memory access, one of ordinary skill would have been motivated by the desire to provide means for accessing the memory to have provided both direct and remote memory access to the system of Hemphill, thereby having provided efficient means for accessing the memory.

As set forth in claims 7 and 17, Hemphill does not disclose a system wherein said set of storage elements coupled to a least one said pair includes a RAID storage system. Hemphill does mention that an array of disks is used; see col. 11, line 61. Official notice is taken to having a RAID storage system. It would have been obvious to a person of ordinary skill in the art at the time this invention was made to have provided the system of Hemphill, with a RAID storage system. The rationale is as follows: It would have been desirable to have had a RAID storage device to provide high levels of data integrity and availability. As having a RAID storage device is a standard way of storing data, one of ordinary skill would have been motivated by the desire to provide means for storing large amounts of data to have provided a RAID storage device to the system of Hemphill, thereby having provided cost-effective and efficient means for storing data.

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5. Claims 8-12, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemphill et al. (US 5,781,716) in view of Kern et al. (US 5,720,029).

As set forth in claim 8, Hemphill discloses a system wherein each pair includes a first node and a second node (100, and 200); each pair is disposed to receive file server commands directed to either said first node or to said second node (either one of 100 or 200 can receive server commands).

As set forth in claim 9, Hemphill discloses a system wherein each said pair is disposed when said file server commands are directed to said first node and said first node is inoperable to execute said file server commands at said second node; and each pair is disposed when said file server commands are directed to said second node is inoperable to execute said file server commands at said first node; see col. 2, lines 20-54, (it is the nature of the fault recovery controllers (116, 216, to provide backup to the systems).

As set forth in claim 10, Hemphill discloses a system wherein each pair is disposed to receive a file server command; and each pair is disposed to failover from said first node to said second node; see col. 2, lines 20-54 (and each respective server is designed to receive commands).

As set forth in claim 11, Hemphill discloses a system wherein each pair is disposed to receive a second file server command; and each pair is disposed to failover from said first node to said second node; see col. 2, lines 20-54 (and each respective server is designed to receive commands).

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As set forth in claim 12, Hemphill discloses a system wherein said first node controls said storage elements in response to said file server command while said second node is coupled to said storage elements and does not control said storage elements in response to said file server command (this is the status quo of the system, see fig. 1, the file server command directed to the first server is separate from that which is directed to the second).

As set forth in claim 18, Hemphill discloses a method including steps for receiving file server commands directed to either a first node or to a second node in each said pair;(either one of 100 or 200 can receive server commands).

As set forth in claim 19, Hemphill discloses a method including steps for when said file server commands are directed to said first node and said first node is inoperable, responding to said file server commands at said second node using; and when said file server commands are directed to said second node and said second node is inoperable, responding to said file server commands at said first node see col. 2, lines 20-54, (it is the nature of the fault recovery controllers (116, 216, to provide backup to the systems).

As set forth in claim 20, Hemphill discloses a method including steps for receiving a file server command at one said pair; and failing over from said first node to said second node see col. 2, lines 20-54 (and each respective server is designed to receive commands).

As set forth in claim 21, Hemphill discloses a method including steps for receiving a second file server command at said one pair; and failing over from said first node to said second node see col. 2, lines 20-54 (and each respective server is designed to receive commands).

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As set forth in claim 22, Hemphill discloses a method including steps for controlling said storage elements in response to said file server command by said first node while said second node is coupled to said storage elements and does not control said storage elements in response to said file server command (this is the status quo of the system, see fig. 1, the file server command directed to the first server is separate from that which is directed to the second).

Hemphill does not disclose having the recovery control for each respective node performing a back-up copying operation concurrent with the receipt of commands from a user. Kern discloses a system wherein commands to the primary site are copied on the secondary site as well in order to provide a mechanism for fault recovery. It would have been obvious to a person of ordinary skill in the art at the time this invention was made to have provided the recovery controller of Hemphill with the means for concurrent recording system commands for fault-recovery purposes, as taught by Kern. The rationale is as follows: It would have been desirable to have had means for transparently switching the control of the system. As Kern teaches the desirability of concurrently recording commands sent to the system in a secondary system, one of ordinary skill would have been motivated by Kern's teaching to have provided the system of Hemphill, with concurrent recording of commands in the recovery controllers, thereby having provided rapid and transparent fault-recovery for the system of Hemphill.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Devarakonda et al. (US 5,566,297) discloses non-disruptive recovery from file server failure in a highly available file system for clustered computing environments.


Schoenthal et al. (US 6,119,244) discloses coordinating persistent status information with multiple file servers.

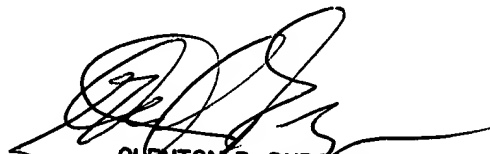
Perndersen (US 5,862,348) discloses method and apparatus for connecting a client node to a server node based on load levels.

Burns et al. (US 6,088,694) discloses a continuous availability and efficient backup for externally referenced objects.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod Kupstas whose telephone number is (703) 305-2655.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess, can be reached at (703) 305-4792. The fax phone number for this art unit is (703) 308-7201. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 305-3900.

Tod Kupstas

March 20, 2002


GLENTON B. BURGESS
SUPERVISORY PATENT EXAMINER
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